



RAN-2411001103010001

B.Sc. (IT) NEP (Sem.- III) Examination February - 2026 Major Data Structures (Paper - 303)

[Total Marks: 50

સૂચના : / Instructions

- (1) ઉપરોક્ત દશવિધ વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fill up strictly the above details on your answer book

Seat No.:

--	--	--	--	--	--

Student's Signature

Q.1. [A] Define the following terms [Any Five]

[5]

- | | |
|----------------------|--------------------------------|
| (1) Non-primitive DS | (2) Bucket overflow |
| (3) PEEP operation | (4) Left Left case in AVL tree |
| (5) Row major order | (6) Terminal node |

Q.1. [B] Answer following questions in short [Any Five]

[5]

- (1) Convert $M + J * B / J$ into postfix without using stack method.
- (2) What is reverse polish notation?
- (3) What is zig-zig case in splay tree?
- (4) How to define pointer to a structure?
- (5) How to count total number of nodes in binary tree?
- (6) What is primitive DS?

Q.2. [A] Answer the following questions in detail [Any Two]

[10]

- (1) Write an algorithm for insertion of a node by position number in doubly linked list.
- (2) What is the hashing technique? Explain hashing with example of hash function and distribution of key value to bucket addresses.
- (3) Create an AVL tree for following values: 10, 20, 30, 40, 5, 9, 60, 50 and perform required rotation.

Q.2. [B] Answer the following questions in brief [Any Two]

[6]

- (1) Create the max heap tree for values: 5, 10, 20, 2, 1, 6
- (2) Write an algorithm to delete an element from simple queue.
- (3) Perform shell sort in ascending order on following values: 10, 30, 40, 35, 63, 18

Q.3. [A] Answer the following questions in detail [Any Two]

[10]

- (1) What is a splay tree? Explain zag-zig, zig-zag cases with an example.
- (2) What is a circular queue? Write an algorithm to delete an element from circular queue.
- (3) Write an algorithm to convert an infix expression to postfix expression.

Q.3. [B] Answer the following questions in brief [Any Two] [6]
(1) What is a hash collision?
(2) Evaluate this postfix expression: 5,25, +, 4, *, 5, /
(3) Write simple steps to display all nodes from first to last in doubly linked list

Q.4. [A] Search 90 from following set of values with binary search: 10, 20, 30, 40, 60, 70, 90. Show all steps. [5]

OR

Q.4. [A] Explain linked storage and threaded binary storage representation.

Q.4. [B] What is Big-Oh notation? Which algorithm of sorting gives minimum time execution? [3]
